

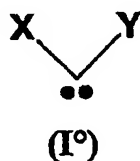
**IN THE CLAIMS:**

Please cancel claims 1-27, and add new claims 28-60, as shown below in the detailed listing of all claims which are, or were, in this application:

28. (New) A method for preparing polyorganosiloxanes (POSSs) by ring-opening and/or redistribution polymerization of POSSs, in the presence of a catalyst (C), wherein said catalyst (C) comprises at least one carbene.

29. (New) The method of claim 28, wherein the carbene of catalyst (C) comprises two nonbonding electrons, which are in the singlet or triplet, preferably singlet, form.

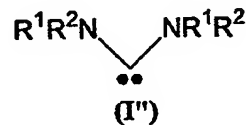
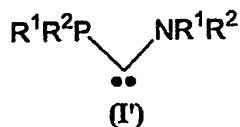
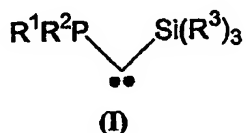
30. (New) The method of claim 28, wherein the carbene of catalyst (C) has a general structure represented by formula (I°):



wherein:

- X and Y are independently chosen from the group comprising:  
S, P, Si, N and O;
- X and Y are optionally substituted;
- X and Y can be connected via at least one optionally substituted five-, six- or seven-membered hydrocarbon-based ring; or a five-, six- or seven-membered heterocycle comprising one or more hetero atoms chosen from the group comprising: S, P, Si, N and O, and optionally substituted.

31. (New) The method of claim 30, wherein the carbene of catalyst (C) has a general structure represented by formula (I), (I') or (I''):



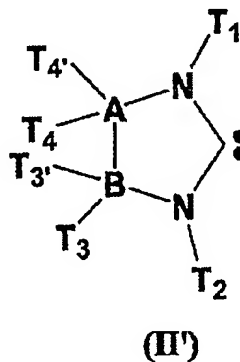
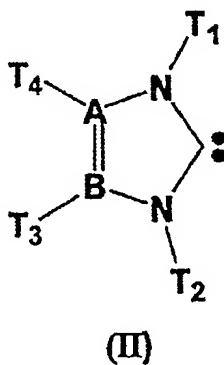
wherein:

- R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup>, which may be identical or different, independently represent an alkyl group; an optionally substituted

cycloalkyl group; an optionally substituted aryl group; or

- the groups  $R^1$  and  $R^2$  can together form an optionally substituted five- or six-membered hydrocarbon-based ring; or a five- or six-membered heterocycle comprising one or more hetero atoms chosen from the group comprising: S, P, Si, N and O, and optionally substituted.

32. (New) The method of claim 30, wherein the carbene of catalyst (C) corresponds to formula (II) or (II'):



wherein:

- A and B independently represent C or N, with the proviso that:

- in formula **(II)**, when A represents N, then T4 is not present, and when B represents N, then T3 is not present;

- in formula **(II')**, when A represents N, then T4 or T4' is not present, and when B represents N, then T3 or T3' is not present;

- T3, T3', T4 and T4' independently represent a hydrogen atom; an alkyl group; a cycloalkyl group optionally substituted with alkyl or alkoxy; an aryl group optionally substituted with alkyl or alkoxy; an alkenyl group; an alkynyl group; or an arylalkyl group in which the aryl part is optionally substituted with alkyl or alkoxy; or

- T3 and T4 can form, together and with A and B when the latter each represent a carbon atom, an aryl, it being understood that, in this case, T3' and T4' are not present;

- T1 and T2 independently represent an alkyl group; an alkyl group optionally substituted with alkyl; an alkyl group that is perfluorinated or optionally substituted with a perfluoroalkyl group; a cycloalkyl group optionally substituted with alkyl or alkoxy; an aryl group optionally substituted with alkyl or alkoxy;

an alkenyl group; an alkynyl group; or an arylalkyl group in which the aryl part is optionally substituted with alkyl or alkoxy; or

T1 and T2 independently represent a monovalent radical of formula (V) below:



wherein:

- V1 is a saturated or unsaturated, hydrocarbon-based divalent group, preferably an optionally substituted linear or branched C<sub>1</sub>-C<sub>10</sub> alkylene,

- V2 is a monovalent group chosen from the group of the following substituents:

- ♦ alkoxy, -OR<sup>a</sup> with R<sup>a</sup> corresponding to hydrogen, alkyl or aryl;

- ♦ silyl, -Si(OR<sup>b</sup>)<sub>x</sub>(R<sup>c</sup>)<sub>3-x</sub> with R<sup>b</sup> corresponding to hydrogen, alkyl, silyl or siloxanyl, R<sup>c</sup> corresponding to alkyl or aryl, and x being an integer between 0 and 3;

- ♦ amine, preferably -N(R<sup>a</sup>)<sub>2</sub> with R<sup>a</sup> corresponding to hydrogen, alkyl or aryl; or

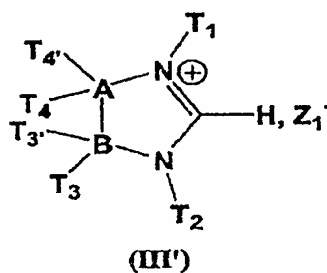
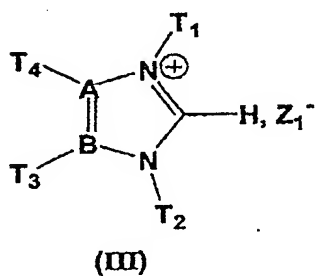
- the substituents T1, T2, T3, T3', T4 and T4' can form, in pairs, when they are located on two adjacent vertices in formulae

(II) and (II'), a saturated or unsaturated hydrocarbon-based chain.

33. (New) The method of claim 28, wherein the carbene is prepared separately, and/or is generated in situ from at least one precursor.

34. (New) The method of claim 33, wherein the precursor is a salt corresponding to the carbene, which is reacted with at least one base, so as to generate the carbene in situ.

35. (New) The method of claim 34, wherein the corresponding salt is at least one corresponding heterocyclic salt of general formula (III) or (III'):



wherein:

- A and B independently represent C or N, with the proviso that:

- in formula (III), when A represents N, then T4 is not present, and when B represents N, then T3 is not present;

- in formula (III'), when A represents N, then T4 or T4' is not present, and when B represents N, then T3 or T3' is not present;

- T3, T3', T4 and T4' independently represent a hydrogen atom; an alkyl group; a cycloalkyl group optionally substituted with alkyl or alkoxy; an aryl group optionally substituted with alkyl or alkoxy; an alkenyl group; an alkynyl group; or an arylalkyl group in which the aryl part is optionally substituted with alkyl or alkoxy; or

- T3 and T4 can form, together and with A and B when the latter each represent a carbon atom, an aryl, it being understood that, in this case, T3' and T4' are not present;

- T1 and T2 independently represent an alkyl group; an alkyl group optionally substituted with alkyl; an alkyl group that is perfluorinated or optionally substituted with a perfluoroalkyl group; a cycloalkyl group optionally substituted with alkyl or alkoxy; an aryl group optionally substituted with alkyl or alkoxy;

an alkenyl group; an alkynyl group; or an arylalkyl group in which the aryl part is optionally substituted with alkyl or alkoxy; or

T1 and T2 independently represent a monovalent radical of formula (V) below:



wherein:

- V1 is a saturated or unsaturated, hydrocarbon-based divalent group, preferably an optionally substituted linear or branched C<sub>1</sub>-C<sub>10</sub> alkylene,

- V2 is a monovalent group chosen from the group of the following substituents:

- ♦ alkoxy, -OR<sup>a</sup> with R<sup>a</sup> corresponding to hydrogen, alkyl or aryl;

- ♦ silyl, -Si(OR<sup>b</sup>)<sub>x</sub>(R<sup>c</sup>)<sub>3-x</sub> with R<sup>b</sup> corresponding to hydrogen, alkyl, silyl or siloxanyl, R<sup>c</sup> corresponding to alkyl or aryl, and x being an integer between 0 and 3;

- ♦ amine, preferably -N(R<sup>a</sup>)<sub>2</sub> with R<sup>a</sup> corresponding to hydrogen, alkyl or aryl; or

- the substituents T1, T2, T3, T3', T4 and T4' can form, in pairs, when they are located on two adjacent vertices in formulae



(III) and (III'), a saturated or unsaturated hydrocarbon-based chain;

- Z1 independently represents an anion derived from a Brönsted acid (protic acid) preferably chosen from the group comprising:

- carboxylic acids of formula  $G_o\text{-COOH}$  in which  $G_o$  represents an alkyl, and advantageously a  $C_1\text{-C}_{22}$  alkyl; an aryl, advantageously a  $C_6\text{-C}_{18}$  aryl optionally substituted with one or more  $C_1\text{-C}_6$  alkyls;

- sulfonic acids of formula  $G_o\text{-SO}_3\text{H}$  in which  $G_o$  is as defined above;

- phosphoric acids of formula  $G_o\text{-PO}_3\text{H}$  in which  $G_o$  is as defined above;

- the following inorganic acids: HF, HCl, HBr, HI,  $\text{H}_2\text{SO}_4$ ,  $\text{H}_3\text{PO}_4$ ,  $\text{HClO}_4$  and  $\text{HBF}_4$  taken alone or in combination with one another;

- and mixtures thereof.

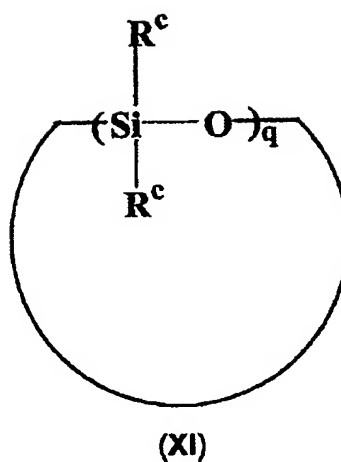
36. (New) The method of claim 28, wherein said method is carried out, by homogeneous catalysis, in a liquid reaction medium in which are at least partially solubilized said catalyst (C) and/or its precursor(s) and the initial POSSs, and optionally at least one base.

37. (New) The method of claim 28, wherein the solubility of said catalyst (C) and/or its precursor(s) is controlled by means of at least one solubilization helper and/or by using at least one carbene substituted with at least one appropriate group.

38. (New) The method of claim 28, wherein said method is performed at a temperature  $T$  ( $^{\circ}\text{C}$ ) such that  $T \leq 200$ , preferably  $100 \leq T \leq 150$ , and even more preferably  $T \leq 100$ .

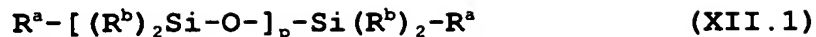
39. (New) The method of claim 28, wherein the concentration of catalyst (C), in mol per 100 g of initial POSSs, in a reaction medium is such that  $[C] \leq 1$ , preferably  $10^{-5} \leq [C] \leq 10^{-1}$  and even more preferably  $10^{-5} \leq [C] \leq 10^{-3}$ .

40. (New) The method of claim 28, wherein the initial POSSs comprise cyclic POSSs (POScy), preferably chosen from those corresponding to general formula **(XI)** below:



wherein R<sup>c</sup> represents hydrogen or an alkyl or aryl radical and  
 $3 \leq q \leq 12$ .

41. (New) The method of claim 28, wherein the initial POSs are linear and are preferably selected from those of general formula (XII.1):



wherein:

- $R^a$  independently represent a hydroxyl, an alkyl or an aryl, optionally comprising one or more hetero atoms and optionally substituted with halogens,
- $R^b$  independently represent an alkyl or an aryl, optionally comprising one or more hetero atoms and optionally substituted with halogens,
- and  $p \geq 2$ .

42. (New) The method of claim 41, wherein a final POS/POScy ratio in the reaction medium is greater than 85/15, preferably greater than or equal to 90/10, and even more preferably greater than or equal to 95/5.

43. (New) The method of claim 31, wherein the following are used:

- o POSs substituted with catalytic functions able to generate carbenes, and preferably catalytic functions derived from products of formula (I°), (I) or (I');
  - o and/or silanes of formula:



wherein:

$R^c$  is a catalytic function able to generate a carbene, and

preferably a catalytic function derived from a product of formula (I°), (I) or (I'),

R\* is an alkyl,

a = 1 to 3.

44. (New) The method of claim 32, wherein the following are used:

o POSS substituted with catalytic functions able to generate carbenes, and preferably catalytic functions derived from products of formula (II) or (II');

o and/or silanes of formula:



wherein:

R<sup>c</sup> is a catalytic function able to generate a carbene, and preferably a catalytic function derived from a product of formula (II) or (II'),

R\* is an alkyl,

a = 1 to 3.

45. (New) The method of claim 35, wherein the following are used:

o POSS substituted with catalytic functions able to generate carbenes, and preferably catalytic functions derived from products of formula (III) or (III');

o and/or silanes of formula:



wherein:

$R^c$  is a catalytic function able to generate a carbene, and preferably a catalytic function derived from a product of formula **(III)** or **(III')**,

$R^*$  is an alkyl,

$a = 1$  to  $3$ .

46. (New) A composition that can be used in particular for the preparation of polyorganosiloxanes (POSSs) by polymerization and/or redistribution of POSSs, comprising

linear or nonlinear POSSs and/or cyclic POSSs (POSSc);

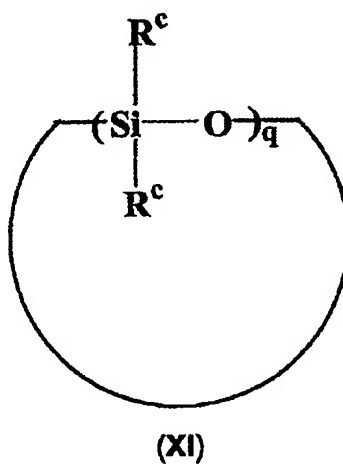
a catalyst (C) comprising at least one carbene in which the two nonbonding electrons are preferably in the singlet form; with the exclusion of any catalyst formed by at least one metal/carbene complex, in particular Pt/carbene;

optionally, at least one solvent;

and, optionally, linear POSSs, for example polydialkyl (e.g. methyl)siloxanes  $MD_pM$  with  $p = 0$  to  $20$ , preferably  $0$  to  $10$ , and more preferably  $p = 0$ : namely, disiloxanes, for example those belonging to the group comprising hexamethyldisiloxane ( $M_2$ ), vinylated  $M_2$  and hydrogenated  $M_2$ .

47. (New) The composition of claim 46, wherein the carbene of catalyst (C) comprises two nonbonding electrons, which are in the singlet or triplet, preferably singlet, form.

48. (New) The composition of claim 46, wherein the initial POSSs comprise cyclic POSSs (POScy), preferably chosen from those corresponding to general formula **(XI)** below:



wherein  $R^c$  represents hydrogen or an alkyl or aryl radical and  
 $3 \leq q \leq 12$ .

49. (New) The composition of claim 46, wherein catalyst (C) is generated in situ from at least one precursor chosen from the group comprising at least one salt corresponding to the carbene, capable of reacting with at least one base, so as to generate the carbene in situ.

50. (New) The composition of claim 46, further comprising at least one solubilization helper and/or the carbene is substituted with at least one solubilizing group.

51. (New) The composition of claim 46, wherein the concentration of catalyst (C), in mol per 100 g of initial POSs, in a reaction medium is such that  $[C] \leq 1$ , preferably  $10^{-5} \leq [C] \leq 10^{-1}$  and even more preferably  $10^{-5} \leq [C] \leq 10^{-3}$ .

52. (New) A silicone composition, comprising:

at least one POS obtained by polymerization and/or redistribution of POSs;

at least one residue of catalyst (C) comprising at least one carbene.



53. (New) A silicone composition comprising at least one POS obtained by ring opening and then polymerization and/or redistribution of POSSs, and in particular of POScy, having a final POS/POScy ratio of greater than 85/15, preferably greater than or equal to 90/10, and even more preferably greater than or equal to 95/5.

54. (New) POSSs substituted with catalytic functions able to generate carbenes, preferably derived from products of formula (I°), (I) or (I') as defined in claim 31.

55. (New) POSSs substituted with catalytic functions able to generate carbenes, preferably derived from products of formula (II) or (II') as defined in claim 32.

56. (New) POSSs substituted with catalytic functions able to generate carbenes, preferably derived from products of formula (III) or (III') as defined in claim 35.

57. (New) Silanes of formula:



wherein:

$R^c$  is a catalytic function able to generate a carbene, and preferably a catalytic function derived from a product of formula (I°) or (I), as defined in claim 31,

$R^*$  is an alkyl,

$a = 1$  to  $3$ .

58. (New) Silanes of formula:



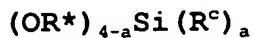
wherein:

$R^c$  is a catalytic function able to generate a carbene, and preferably a catalytic function derived from a product of formula (II) or (II') as defined in claim 32,

$R^*$  is an alkyl,

$a = 1$  to  $3$ .

59. (New) Silanes of formula:



wherein:

$R^c$  is a catalytic function able to generate a carbene, and preferably a catalytic function derived from a product of formula (III) or (III') as defined in claim 35,

$R^*$  is an alkyl,

a = 1 to 3.

60. (New) Use of a carbene comprising two non-bonding electrons, which are in the singlet or triplet, preferably triplet form, as a catalyst or cocatalyst in the preparation of POSSs by polymerization and/or redistribution of POSSs.